

1: Roth--9 [2]

116, 141

(No date) 1890

Tasmanians

"The forehead was high, prominent (Laplace, III. ch. xviii. p. 200), narrow and running to a peak (Davies); the malar bones were prominent, and the cheeks hollow (West, p. 77), and the faces massive (Dumoutier, ix. p. 134)."

"The native of Van Diemen's Land possesses, on the whole, a [11] well-proportioned frame. His limbs, less fleshy or massive than those of a well-formed African, exhibit all the symmetry and peculiarly well-defined muscular development and well-knit articulations and roundness which characterize the negro' (Strzelecki, pp. 334-336). Cook (Voy. Bk. I. ch. vi.) thought the people slender, and Anderson (*ibid.*) well proportioned; while Prinsep (p. 79) says they were 'short in stature, with disproportionately thin limbs and shapeless bodies,' and Mortimer (p. 19) that most of the party he encountered were of the middle size, and though lean, were square and muscular. Laplace (III. ch. viii. p. 200) speaks of the lanky limbs and inflated stomachs of the native; but Dixon (p. 22) agrees with the others that the limbs were muscular and well-proportioned. La Billardière (ch. v. p. 222) mentions a very tall and muscular savage, and elsewhere (ch. x. p. 73) he speaks of a savage of middle size whose figure was very finely proportioned. To Marion (p. 29) they 'seemed to be generally slender, fairly well made, broad-chested, and the shoulders thrown back,' and West describes (p. 77) them with 'breast arched and full, the limbs round, lean and muscular, the hands small, the feet flat and turned inwards.' They had small natural parts (Marion, p. 29). In describing an interview with fourteen of the aborigines, Péron says, 'The majority of them were young men of about sixteen to twenty-five years of age; two or three appeared to be thirty to thirty-five years old; one alone, older than the rest, appeared to be fifty to fifty-five years of age....

Generally all the individuals were of a sufficient stature for their age. Among those arrived at manhood there was one who was not less than 1 metre 786 millimetres (5 feet 10 $\frac{1}{2}$ inches), but he was much thinner and slimmer than his fellows. All the others were from 1 metre 678 millimetres to 732 millimeters (5 feet 6 to 8 inches) in height. One of them... was a young man, twenty-four to twenty-five years of age, called Bara-Ourou, with a much finer constitution than the others, although spoilt by the same constitutional defect common to all his race, that is to say, with a well-developed head, ample and fleshy shoulders, broad chest, and very muscular buttocks, all his extremities were slender and weak, particularly his legs; his stomach also, proportionately, was much too big' (ch. xiii. p. 280). One man killed by Marion's party was five feet three inches in height (1) (Marion, p. 31)."

"1. Old French measure."

"The following results were obtained by Mr. Hull, in 1849, when he weighed and measured the children then in the orphan schools at Newtown. They showed 'that they were shorter than the white race of the same age, but much heavier. One young female, eleven years of age, weighed 102 pounds; another of eight, 86 pounds. The average weight of European children of these ages is stated to be 78 pounds and 60 pounds respectively:-- 60 as compared to 86; 78 as compared to 102' (Hull quoted by Smyth, p. 382)."

"Scientifically the hair has been thus described: 'Two specimens from Van Diemen's Land, one black, the other yellowish-white, approach the hair of the New Irelanders by their tresses, their diameters and internal dispositions. Diameters of the black hairs =25:15; of the light hairs 25:15 to 27:20. The first has no medullary substance; the second has it much enlarged' (Pruner-Bey, p. 81). (1)"

"1. For further details of the hair as a comparative study see the Chapter on Origin."

"It was only very shortly before the Tasmanians became extinct, that the importance of preserving their osteological remains seems to have been recognized, and means taken to secure what specimens were still available. The largest collection of these is lodged in the Museum of the Royal College of Surgeons of England. This consists of specimens procured from various sources at various times by the College itself, and of the collection made by the late Dr. Barnard Davis, acquired by the College in 1880. The specimens collected by the College of Surgeons consists of two complete skeletons and seventeen skulls. Of the former, one is the skeleton of an adult male, the other that of an adult female. The male skeleton was obtained from a grave on Flinders Island, where the remnant of the aboriginal population, when removed from Tasmania, was located between 1832 and 1847. The female skeleton is that of one of the last survivors of the race, Betsy Clark, described in Bonwick's 'Last of the Tasmanians,' 1870, where a portrait of her, from a photograph taken in 1866, is given, who died at Oyster Cove on the 12th of February, 1867, at an age of probably forty years. The other specimens are the skulls of six adult males, six adult females, and three young specimens. Besides these there is an adult male skull and that of a young person reported to be Tasmanians, but regarding their being authentic there is great doubt. The Barnard Davis collection comprises a

complete skeleton of an adult male, the skulls of eight males (1) and five adult females, three young skulls, and the cast of an adult male and female skull. The Anthropological Institute of Great Britain and Ireland possesses [191] one complete skeleton of an adult male. In the Musée d'Histoire Naturelle the skulls of five males, three females, and one child are preserved. In the Museum of the University of Oxford there are seven skulls; in the Museum of Science and Art in Edinburgh there is one skull; the Museum of Netley Hospital possesses two skulls; the Museum of the Army Medical Department of Dublin has four skulls. Mr. James Bonwick possesses one skull in his collection of Tasmanian relics; one skull is preserved in the Museum of Breslau; the Museum of Vienna also contains one skull. In the Museum of the Royal Society of Tasmania there are reported to be two skeletons and sixteen skulls; but regarding the authenticity of seven of the latter, there seems to be some doubt.

As far as I am able to ascertain, these appear to be all the osteological remains now extant of this interesting people. Added together, this list comprises six complete skeletons, and not more than about seventy skulls, including the young specimens."

"1. There seems to be some doubt as to two of these being skulls of Tasmanians."

"Several of these specimens have been described already, and some of their measurements recorded; thus Dr. Bernard Davis in 1874 published a valuable paper on the Osteology and Peculiarities of the specimens in his Collection in the 'Naturerkundige Verhandlungen der Hollandische Maatschappij der Wetenschappen, 1874;' Professor Flower has described the specimens in the Royal College of Surgeons' Collection previous to the incorporation of the Barnard Davis specimens, in his lectures on Anthropology, published in the 'British Medical Journal,' Vol. I, 1879, and the principal measurements are recorded in his edition of the Catalogue of the 'Osteological Series, Part I. of the College of Surgeons' Museum.' The Paris collection has formed the subject of a valuable monograph by Dr. Paul Topinard, in the 'Mémoires de la Société d'Anthropologie,' Vol. III, p. 307, and it has also been described by Quatrefages and Hamy in the 'Crania Ethnica.'"

"The measurements given by these authors unfortunately differ considerably owing to the various systems of measurement which have been followed. The most extensive series of observations on the dimensions of the skulls are those given by the three French authors on the Paris specimens, whose tables I shall include in this monograph, and have taken as the basis of measurements of the specimens in British museums, which I have been able personally to measure. In measuring the long bones I have followed the directions laid down by Topinard and Hamy."

Stature. --The materials at my disposal for estimating the stature [192] of the skeleton is very inadequate for the purpose, consisting as it does of only three articulated male skeletons, and one female skeleton. I have been unable to ascertain the measurements of the two skeletons in the Museum of the Royal Society of Tasmania, as they do not appear to have been published.

The male skeleton (No. 1096 in the Catalogue of the Royal College of Surgeons' Museum) measures 1607 mm. in height; that in the Barnard Davis Collection 1640 mm. ; and that in the Anthropological Institute 1635 mm. The average stature of the three male skeletons therefore is 1627 mm. The female skeleton in the Royal College of Surgeons' Museum measures 1422 mm. "

"What do these measurements of the height of the skeleton represent in the living subject? A series of observations made in Paris on twenty-four bodies measured before and after dissection showed that the difference between the height of the entire subject and of the articulated skeleton is 34 mm. (1) Adding this difference to the measurements of the male Tasmanian skeletons, the stature of the three when in life would average 1661 mm., the shortest being 1641 mm., the tallest 1674 mm., and the intermediate one 1669 mm. In the same way the female skeleton would represent a woman 1456 mm. in height. These calculations from the skeleton of the stature of the person when in life depend upon the manner of articulation, which differs very much, and are therefore probably not to be relied on so much as the estimates of height deduced from the lengths of the lower limbs, which will be discussed when treating of the measurements of the appendicular parts of the skeleton.

Let us now compare the average and individual statures of the skeleton with the records of observations made by travellers on the living. Dr. Barnard Davis states that the stature of twenty-three Tasmanian men measured by G. A. Robinson varied between 1548 mm. and 1713 mm., the average being 1618 mm. Pèron, on the other hand, states that the usual stature of the Tasmanian ranges between 1678 mm. and 1732 mm. The mean of the average statures of Robinson and Pèron is 1661 mm., which is exactly the same as the average stature we have shown the three skeletons would probably have during life.

¹l. Topinard: 'Elements d'Anthropologie générale,' pp. 1032-1065. "

1: Roth--192

(No date) 1890

Tasmanians-2

116, 141

Marion gives the measurement of one man as 1600 mm. Dr. Barnard Davis states that Robinson found the height of 29 women measured by him ranged from 1295 mm. to 1630 mm. and averaged together 1503 mm."

"The Skull. -- The localities from which most of the skulls in the Royal College of Surgeons Collection were obtained are unknown. Particulars regarding the locality of skeletons have already been given. The cranium numbered in the Museum Catalogue 1101 was marked 'Tasmanian warrior killed at Brushy Plains;' No. 1106 is from Port Dalrymple; No. 1108 is from a grave in Bruny Island; No 1113, the cranium of an infant, was also obtained from Port Dalrymple. Three of the Barnard Davis specimens, Nos. 1414, 1415, 1417, were obtained on the north-west side of the island, in the district of the Surrey Hills; the localities whence the other specimens in his collection came from is unknown. Several of the skulls appear to have been obtained when the natives were being removed from place to place, shortly before they finally became extinct. The skulls in the Paris Collection were obtained from the voyages of the Astrolabe and the Zelée to the South Pole and Oceania, during the years 1826-1829, and of the Favorite during 1830-1832, and from the expedition of M. Jules Verreaux in 1843. Five of the specimens were obtained from the south side of the island, three of these were obtained from the south side of the island, three of these were procured from the neighbourhood of Hobart during the voyage of the Favorite by M. Eydoux; the other two from Lake St. Clair, the source of the Derwent, were brought home by M. Dumont D'Urville in the Astrolabe and Zelée expedition. Four of the specimens were obtained from the north side of the island in the basin of the Tamar; two of these, from Launceston, were collected by Verreaux; a third came from Port

1: Roth--193

(No date) 1890

Tasmanians-2

116, 141

Dalrymple, collected by Dumont D'Urville; and a fourth, that of a young subject, from the district of Furneaux, collected by M. Dumontier during the voyage of the Astrolabe and Zelée."

"Some differences have been observed between skulls from the north, south, and north-west parts of the island by Quatrefage and Hamy in the '*Crania Ethnica*,' and these authors have accordingly described separately the skulls from each district. While some skulls from one district are shorter than others from another district, the small number of specimens at their disposal from each district does not, in my opinion, justify such importance being attached to the variations observed, as to render it necessary, or advisable, to follow them in separating the skulls into different groups, according to the locality whence they were obtained, although I admit there may have been influences, such, for example, as contact at one part of the island with neighbouring people of one race, and at another part with an entirely different race, which may have caused slight variations in the population of particular [194] parts of the island. For practical purposes therefore all the specimens may be classed together."

"Dr. Topinard describes the skulls in the Paris Collection very fully in his monograph referred to. He states their general configuration is sufficiently characteristic to enable a practical eye to distinguish them from those of other races. When viewed from above the vault of the cranium presents the appearance of a regular oval, narrow in front, widening rapidly till it attains its greatest breadth at the level of the parietal eminences, and then decreasing suddenly. The narrowest part of the frontal region is about 25 mm. above the root of the nose, and 8 mm. above the ophryon. At this place there is a transverse depression more or less marked, from which the frontal bone rises and curves backwards without presenting any noteworthy prominence or crest: but 2 or 3 cm. in front of the bregma, a convexity of oval form begins to appear; this narrows, and after passing the bregma, resolves itself into an antero-posterior crest, depressed in the middle line for the sagittal suture; it then seems to become double, and terminates about midway between the anterior and posterior fontanelles. On each side of this crest, about 1 cm. in front of the coronal suture, two grooves running from before backwards appear, which become deeper as they extend backwards; these terminate gradually about the middle of the parietal bones. Lastly, quite outside are situated the parietal bosses very much developed and even conical. This characteristic carinate appearance is constant in varying degrees in all the Tasmanian skulls in Paris. The posterior part of the

parietal region is smooth, and recedes gradually at first, but rapidly afterwards, towards an elliptical convexity, the long axis of which is transversely placed, formed by the supra-occipital region. Theinion is feebly marked, corresponding to an average of No. 1 of Broca. The sides of the cranium present an important character. They are rounded in the region of the spheno-temporal suture, their upper limits being defined by a rather feebly developed temporal crest.

The characters of the cranium may be summed up as follows: Globular in form, sub-dolichocephalic, without notable transverse depression as to the rise of the forehead, broadening rapidly from before backwards, with rounded sides and large conical parietal bosses. The frontal crest is absent, but a characteristic disposition of the vault termed keeled is present. The posterior parietal region is receding."

"Compared with Parisian skulls the supra-occipital portion of the [195] Tasmanian cranium is 17 mm. shorter, and the difference between antero-posterior maximum and iniac diameters shows that the cerebellum is not so much covered by the cerebral lobes as in the Parisians. The basio-iniac radius on the other hand is 19 mm. longer in the Tasmanians, showing that their cerebellum is notably larger. The anterior central lobes have nearly the same relative development in both Tasmanians and Parisians, the anterior part of the posterior central lobes is somewhat less developed, and the posterior part much less developed in the former than in the latter. The cerebellum is larger in the Tasmanians by a quantity approximatively equal to the diminution of the other parts."

"The facial portion of the skull is as characteristic as the cranium. The first thing which strikes one is the wild and sinister appearance which invests the whole physiognomy, and which may be attributed to the depth of the orbits and the form of the notch of the nose. These peculiarities are due firstly to an excessive development of all the facial portion of the frontal bone, and secondly to a backward recession en bloc of the superior ends of the nasal bones and ascending processes of the superior maxilla, the curve of the frontal bone being prolonged downwards to meet the nasal bones at their inferior and anterior extremity."

"A second marked character of the face is the heaping up of the bones in the median line producing shortening of the vertical diameter and an appearance as if the facial skeleton has been forced outwards by pressure directed from below, the effect of which is first visible at the union of the root of the nose and frontal bone, as a semi-luxation backwards of the nasal bones and of ascending apophyses of the maxillae. The facial length of the Tasmanian is considerably shorter than that of the French, while both are of about the same breadth. Each section of the median portion of the face, except the supra-nasal, contributes to this shortening in the Tasmanians. The inferior bimaxillary and the bi-malar diameters are greater, while the bi-zgomatic diameter is smaller than in the French skull. The malar bones are of small dimensions, their two surfaces are placed edgeways and form either a slightly obtuse angle or a right angle; the inferior border is exactly horizontal and the zygomatic apophyses are directed horizontally backwards."

1: Roth--196 [2]

(No date) 1890

Tasmanians

116, 141

"The measurements of the mandible are diminished in every case; thus the symphyses is vertically short, the bigonial width is diminished, as well as the height of the posterior branch. The prognathism of the face is moderate, and in all cases considerably less than in the Australians. The borders of the palatine vault diverge behind, that is to say, the palate is parabolic, but there is a tendency to inflexion of its posterior ends in some cases. The teeth are in a good state, and in one skull are well set; but in another the incisors have been split or broken, without doubt during life; the crowns of the molars are ground down."

"The most notable characters of the face may be summarized as follows:--short, relatively broad, and unusually developed in the supra and inter-orbital parts, giving to the orbits, the notch of the nose and the inter-superciliary space, special characters; the superior maxillary shortened vertically, broadened transversely, and as it were thrust under the cranium, the lower jaw small in every proportion; the malars small, moderately wide apart, placed edgeways, the anterior surface looking well forwards, and their external surface well outwards; prognathism moderate. Dr. Topinard considers the Tasmanian skull is constructed on a [197] uniform type, recognizable at first sight, and that it is the skull of the Melanesian surmounted with the parietal bones of the equatorial Polynesian. The face, moreover, is not homogeneous. While in Dr. Topinard's opinion there are certain characters presented which would lead us to regard them as the remains of an autochthonous race originally pure, and very distinct from their neighbours, there are others which seem to favour their multiple origin."

"Quatrefage and Hamy distinguish as 'Tasmanians of the south' the former inhabitants of the basin of the Derwent and Huon rivers. From this district three of the male and two of the female skulls in the Paris Collection were obtained. Their antero-posterior diameters are relatively a little shorter than those of the north and north-west of the island, their cephalic index being 77.1; while those of the north are 76.34, and of the north-west 76.16. Upon this ground these authors place them in a separate group. Taking the skull which has been reproduced on Pl. XV. and XVI. they proceed to call attention to the carinate form of the cranial vault, which they state appears to be constant in the adult Tasmanian."

"The frontal bone is more elongated (measuring over the curve 138 mm.), also more oblique and depressed (the bregma being only 131 mm. above the anterior border of the occipital foramen), likewise a little narrower at the base (the minimum frontal diameter being 97 mm.), than in the Papuans of Rawak, which in some respects it resembles, whilst the maximum diameter is the same in both (118 mm.). The superciliary arches are large, and their size is exaggerated by the sunken appearance presented by the upper part of the face situated immediately below them. The frontal bosses are well marked, while the median portion is expanded as a convex surface of oval form, which extends beyond the bregma and is fused with a kind of parietal crest, the sides being separated from the eyebrows by a slight depression and from the median boss by a flat portion which is continuous with that which bounds the sagittal convexity of the parietals. The temporal line is feebly marked, and the portion of the frontal which forms part of the temporal fossa is moderately flat."

"The curves and planes of the frontal bone just described are continued on to the parietal bones as far as the level of their tubera, which are strongly marked, almost conical in shape, and situated [198] equidistant from the coronal and lambdoidal sutures in the course of the temporal line. The antero-posterior median convex surface is prolonged as far as the middle of the sagittal suture, which is situated in a slightly undulating groove, and is separated from the tubera by two depressions very nearly symmetrical and fairly well marked. It is the presence of these three crests and two intermediate concavities which gives the carinate appearance resembling the keel and sides of a ship to the cranium. Beyond the bosses the antero-posterior curve changes suddenly; the median elevation completely disappears, as well as the lateral depressions, and there remains only a convex plane slightly flattened in the centre which ceases at the lambda. From the tubera the parietals descend without bulging, but converge slightly below, especially in front towards the squamosals, which are greatly reduced in size. The great wings of the sphenoid are short, and do not articulate with the parietals."

"The central part of the occipital bone is short and narrow, and markedly convex from above downwards; the occipital protuberance is feebly marked. The cerebellar part is relatively large, the two prominences corresponding to the cerebellar lobes are well marked, and the muscular attachments are strongly developed, as are also those of the base.

The sutures are simple and generally somewhat more occluded in front than behind. The bones are dense and polished; the skull is heavy, although its walls are of moderate thickness. The impressions of the convolutions on the interior surface are relatively clear and deep, particularly at the base, a condition which Grateolet has shown to occur in lower races."

"The face is characteristic not on account of size, which is not exceptional, but owing to its shortness and its particularly brutal appearance. The malar bones are depressed at their superior angles. The nose is of moderate length, but very broad, and is deeply pressed in at the root. The nasal bones proper are concave in profile, somewhat flattened, very convex, and pinched together (especially above the ascending branches of the maxillae which support them), and are alternately concave and convex from above downwards, and from without inwards. The inferior border of the nasal opening is rounded and elevated in the middle line. The nasal spine is double. The orbital openings are horizontal and of elongated square form. The canine fossae are deep, and the anterior alveoli are visible on the surface of the dentary arch as large rounded swellings."

"The prognathism is moderate, and affects the whole face, not very marked in the subnasal region. The disposition of parts resembles that found in the Mintiras, a true Negrito race. The prominence of the lower part of the forehead is considerable, so that the facial angle, measured by taking the supraorbital point as the upper end of the facial line, attains 75° , although the upper jaw taken by itself shows a projection corresponding to a very much smaller angle. The alveolar angle is 66° , and the dentary angle is 59° ."

1; Roth--199 [2]

(No date) 1890

Tasmanians

116, 141

"The palate is deep and elongated, and the difference between its breadth in front and behind is much less than usual. The teeth are very large, the molars and premolars are marked by having very distinct and sharp tubercles, the canines are prominent and thick (11 mm.); the incisors, especially the central ones, attain a quite exceptional development, being spade-like, 11 mm. broad by 13 mm. in length to the neck, and project forwards."

"The mandibular arc is ellipsoidal, the thickness of the horizontal branch is considerable, the external surface is somewhat rough, the mental fossettes are deep and well marked; the chin is of irregular form, arched, and of considerable height, the mental angle 73° , notwithstanding the alveolar projection. The projection is more accentuated on the internal surface where the superior genial tubercles are very large, and the mylohyoid ridge is strongly marked. The ascending rami are feeble, and present a marked contrast to the stronger horizontal branches. The surfaces for the insertion of the temporal muscles are feebly marked; the same has been already noted in respect of the surfaces of origin on the cranium, indicating that these muscles were feebly developed, as the other muscles of mastication also appear to have been. The ascending branch is high, but narrow and very slender; the coronoid process is short and sharp, the condyle is very slender, twisted on the inside and below, and is supported by a very short neck. The sigmoid notch is little hollowed out. The posterior angle is rounded, and does not present the least trace of a prominence, and the mandibular angle is very obtuse.

This description, Quatrefage and Hamy state, is applicable in general to all the other Tasmanian skulls, though in some specimens the muscular ridges are more fully developed, while in others they are feebler. In one case the frontal bone articulates directly with the temporals."

l: Roth--199-200

(No date) 1890

Tasmanians

116, 141

"The female skulls they state do not differ from those of the males except in those characters which differentiate generally the skulls of [200] the two sexes. The form of the cranium, while differing little in its proportions from the general type, is very appreciably softened down, but within relatively narrow limits."

"The specimen taken as the basis of the description of the Tasmanian skull by Quatrefage and Hamy, figured in Pl. XV. and XVI. of the present work, was brought home to Paris as an entire head preserved in spirits, and after being photographed was dissected and prepared as a dry specimen by Prof. Gervais some years ago. On opening the cranium, it was found that the encephalon was greatly altered, and indeed was reduced to an amorphous mass, so that its morphological characters could not be studied, but a cast was made of the cranial cavity and corrected very carefully with the brain itself while still covered with the dura mater, so that it might be as exact a representation of the external form of that organ as possible. The cast is figured in Pl. XVII. It measures 163 mm. antero-posteriorly, and its maximum width is 132 mm., while the transverse diameter of its anterior part is 93 mm. When compared with the encephalon of a Bushwoman studied by Cuvier and de Blanville immediately after death, it is seen to possess characters of an entirely different type. The length of the Bushwoman's encephalon measures 160 mm., its maximum breadth 125 mm., and the breadth of the anterior part 100 mm. The brain of the Tasmanian is more arched, and consequently more elevated, than in the Bushwoman, agreeing in this respect with the form of the brain of Europeans. The middle meningeal vessels are less marked than in the Bushwoman, notwithstanding her sex. The antero-posterior part of the middle lobe is more voluminous, and appears

1: Roth--200

(No date) 1890

Tasmanians-2

116, 141

to be proportionately more convoluted than in the Bushwoman; indeed, the corresponding portion of the cerebral dura mater indicates a condition of parts more approaching what obtains in the white races."

"The characters of the skulls preserved in the Museums of this country agree very closely with the specimens in Paris which have been so well described by Quatrefage, Hamy, and Topinard. In some specimens the markings distinctive of the Tasmanian skull as set forth by those authors are less pronounced than in others, but the range of variation is very small. The general measurements also agree very closely, and the woodcuts, Figs. 8, 9, 10, from Topinard's work, give a very good average representation of the male skulls in the College of Surgeons Museum. There are one or two instances in which the degree of prognathism is considerably in excess of any of the Paris specimens, especially in the skull [201] belonging to the skeleton of the male in the Barnard Davis collection. This skull being somewhat exaggerated in some of its characters, it has been thought desirable to give an illustration of it in Pl. XIX., as the only other published drawing in the Thesaurus Craniorum is somewhat too small to convey to the mind an adequate idea of its characters. The original drawing, of which that on Pl. XIX. is a reduction by photography to one-half the natural size, was made directly from the specimen itself by means of Broca's stereograph, and is an accurate representation of the skull, except that the zygomatic arches are thicker than they should be."

"The prognathism of this skull exceeds that of any of the Australians, and the teeth are of larger size than in any skull in the Museum. The incisors are also very wide, and markedly of the shovel-shaped pattern mentioned by Quatrefage and Hamy. The small size of the coronoid processes of the mandible is noteworthy, all of it being seen some distance below the zygomatic process of [202] the malar bone. The illustration also shows the mastoid processes to be of small size. The form of the glabellar region is more rounded than usual in this specimen, but all the characteristic features of the Tasmanian are well marked."

"As regards the general characters of the cranial portion of the skull, the angular form, the prominent median ridge, and the flattened upper parietal region already described, are generally well marked. The parietal eminences are developed to a greater or less degree in all the specimens. Seen from behind the braincase appears five-sided. The glabella is prominent, and overhangs the nasals in every case, even in the females. The mastoid inion and the muscular ridges are rarely much developed. The skull of the skeleton in the Anthropological Institute and that of an old woman in the College of Surgeons Collection have the median frontal suture unobliterated, that is to say, they are metopic. In no case does the squamosal bone meet the frontal at the pterion, though they almost meet in several specimens. The size of the [203] skulls appear to be about the same as those in Paris, judging from the measurements of circumference, height, and the cranial capacity. Prof. Flower has noted those in the College of Surgeons Collection to be smaller, while those in the Barnard Davis Collection are larger than the Paris specimens; but when the measurements of the two former series are united, their average measurements agree with those of the Paris skulls. In about 20 per cent. the height of the cranium is greater than the maximum breadth, but the average breadth index is greater than the altitudinal index."

"The face is very short from above downwards between the nasion and alveolar point, and the depression of the upper part, upon which Dr. Topinard lays so much stress, is well marked. The [204] orbits of the males are low, elongated, of quadrilateral shape, and their upper margins project greatly beyond their lower, as Topinard has noted in the Paris specimens. Between the orbits of the males and females there is a marked difference, contrary to what has been noted in the Paris specimens. In the females the orbits are more rounded and open, owing to the upper margins being less strongly developed; consequently the orbital index is higher. The nasal portion of the face agrees very closely with that of the specimens in Paris already described. In some cases the nose is not so broad as in others, and a few specimens are mesorhine; but the mean nasal index is 56-57, which places them in the platyrrhine group."

"Prof. Flower has noted an interesting point regarding the teeth in which the Tasmanians seem to differ from all other kindred races, namely, 'the tardy development and irregular position of the posterior molars. These teeth are generally of large size, but there appears to be too little room for them in the jaw, so that only in two out of eleven adult skulls in which their condition can be observed are all of them normally placed; in all the others one or more of the wisdom teeth are either retained beneath the alveoli or are in oblique or irregular positions.' (1) In estimating the size of the teeth that author measures the length in a straight line of the crowns of the five teeth of the upper molar series in situ between the anterior surface of the first premolar and the posterior surface of the third molar, which he designates as the dental length. (2) As this absolute length is hardly sufficient for the purpose of comparing races, since the size of the

"1. Flower, On the Native Races of the Pacific Ocean, Royal Institution Lectures, 1878.

2. Flower, Journ. Anthropol. Inst., Nov. 1884, p. 183."

individual and of the cranium generally should be taken into account, he takes as a standard length to indicate the general size of the cranium the distance between the basion and the nasion--the basio-nasal length--as the most convenient with which to compare the dental length and so form a dental index. In the Tasmanians the dental length averages in the males 47.5mm., and in the females 46.5 mm., while the basio-nasal length is 100 mm. and 95.5 mm. respectively, which gives a dental index to the males of 47.5 and to the females of 48.7. These indices show them to have proportionately the largest teeth of any race known, the nearest approach to them being the dental index of the Andamanese and Australians: in the former the dental index of the males is 44.4, and of the females 46.5; and in the two sexes of the latter 44.8 and 46.1 respectively."

"A point of interest and perhaps of importance, from a sociological aspect, is the absence of the two upper central incisors of the male skeleton and of the four upper incisors of the female skeleton in the College of Surgeons Collection. The teeth have been lost during life, and the alveolar border where they formerly were situated is so atrophied, that there is no trace of the sockets remaining. This points to the fact that the teeth have been lost a considerable time before death. On comparing the male skull with the skulls of Australians, in which the upper central incisors are absent, owing to their having been knocked out of the head as part of the Initiation Ceremonies through which the youths are put on reaching manhood, the appearance presented is exactly similar. It would seem to be probable from the condition of this skull that such ceremonies existed also among the Tasmanians, though it is difficult to account for the removal of the teeth of the women, as corresponding ceremonies are not known to have been practised among females anywhere."

The Vertebral Column. --The length of the vertebral column from the upper surface of the atlas vertebra to the under surface of the last lumbar vertebra (neglecting the dorsal lumbar and sacral curves) averages in the three male skeletons 511 mm.; the length of the female spine is 459 mm. Topinard gives the length of the trunk from the spinous process of the seventh cervical vertebra to the apex of the sacrum as averaging 474 mm. in three skeletons, and shows that in respect to the length of the spine the Tasmanian differs from the European in being both absolutely and proportionately shorter to the total stature, and it agrees with the measurements of the spine in the Australians and Negritos."

"Prof. Cunningham of Dublin has studied with great minuteness the curve of the lumbar vertebrae of different races. Where the vertical heights of the posterior part of the bodies of the five lumbar vertebrae equal the total of the individual measurements of the anterior surface of these vertebrae, it is evident the lumbar portion of the spine would be straight. Cunningham has shown that in the Europeans the index formed by the sum of the posterior measurements is less than those formed by the anterior measurements, and he expresses the difference by means of the Lumbo-Vertebral index. Taking the anterior measurements as the standard, he finds that in Europeans the Lumbo-Vertebral index is 95.8, which indicates that the convexity of the curve is directed forwards. In the Tasmanians the Lumbo-Vertebral index averages 108.5 in the males, and 104.7 in the females, and in the Australians 110.1 in [206] the males and 103.1 in the females; and in the Andamanese 106.3 in the males and 102.4 in the females, showing that in these latter races the vertebrae are thicker behind than in front; and if placed together without the intervening discs, would give the lumbar region a curve in an opposite direction to what obtains in the European. In this character they resemble the Apes, in which the Lumbo-Vertebral index is always over 100. But it may be asked, has the moulding of the vertebral bodies any relation to the degree of lumbar curvature, and is a low lumbo-vertebral index associated with a high degree of curvature and vice versa? Cunningham has shown that there is a general correspondence, and that the bodies of the vertebrae in the lumbar region are found in a more or less marked manner in accordance with the degree of

the lumbar curve, though the difference in height between the anterior and posterior surfaces of the lumbar vertebrae is so slight that it has little or no influence in determining the curve. The differences in height between the anterior and posterior surfaces of the lumbar vertebrae he considers must be looked upon as the consequence but not the cause of the curve. 'The cause is a hereditary one, and it has originated from influences operating upon the bodies of the vertebrae, as the lumbar curve has become in successive generations more and more firmly established.' (1) In the savage state he explains this ape-like condition of the lumbar vertebrae is retained in connection with their habits of life, where flexibility of the spine is more necessary than stability. The European, on the other hand, whose manner of life for generations past has developed stability, as it is evident that the deeper the bodies of the vertebrae become in front, the more permanent, stable and fixed the curve will become, and the more restricted will be the power of bending forwards at this region. In the Tasmanians, Australians, and other low races the lumbar curve is entirely produced by the intervertebral discs, and in no way by the vertebrae."

"1. Cunningham, Memoirs Roy. Irish Acad. No. ii. 1886."

"The Thorax. --The average antero-posterior diameter of the thorax of the males is 185 mm., and the transverse diameter 297 mm., giving a thoracic index of 160.5, the antero-posterior diameter being taken as 100.

The last rib is well developed, measuring on the average along the curve 8 cm.

The Pelvis. --The only Tasmanian pelvis which has been described is the specimen in the Museum of the Jardin des Plantes in Paris. [207] Dr. Barnard Davis has given a few of the measurements of the pelvis in this country. With the exception of those in the Museum of the Royal Society of Tasmania, the only specimens that remain of this portion of the skeleton is that of a male, just mentioned, in Paris, and the three male pelves and one female pelvis belonging to the skeletons in this country. But before describing this small series, I may state Dr. Verneau's conclusions regarding the specimen in Paris, which I had an opportunity of measuring a few years ago. He says the height of the pelvis is somewhat small in proportion to its breadth, the iliac crests are farther apart behind than in Melanesian pelves, the anterior curve of the crests is very considerable. The ilia are less developed than in Europeans, and are very little hollowed out or twisted outwards. The transverse diameter of the brim is greatly diminished. Owing to the broken state of the sacrum the dimensions of the pelvic outlet could not be ascertained. The symphyses pubes are short, measuring only 33 mm. The pubic arch forms an angle of 65°. The lower part of the pelvis is a little smaller than in Europeans. The sciatic

1: Roth--206-207

(No date) 1890

Tasmanians-2

116, 141

spines are situated very low, and the distance which separates them from one another is greater than in Europeans. The obturator foramina and the cotyloid cavities are small, the height and breadth of the latter are equal. The scarum is narrower throughout, and at its base is 16 mm. narrower than in Europeans."

"The following are the principal measurements of the pelves taken as I have recommended in my monograph on Pelvetry (see page 208): (1)

For purposes of comparison I have placed side by side with the column of the average measurements of the Tasmanian male pelves the corresponding averages of 17 New Caledonian and 40 European male pelves neither of which I have previously published; the European pelves are chiefly English and French. The sacrum is largest both in length and breadth in Europeans; its shape is also different, as shown by the sacral index, which is considerably higher in the Europeans, indicating that the sacrum is proportionately broader in the latter than in the Tasmanians or New Caledonians. In respect to the measurements of the sacrum and several other pelvic measurements, it is curious how closely each of the four Tasmanian specimens agree in many instances. I was not aware of this fact till I came to write out in tabular form the measurements made at various times and at the different institutions in which the specimens are preserved. I was still less prepared to find the averages of the Tasmanian and New Caledonian male pelvis correspond so exactly as they do. Sir W. Turner (1) gives the mean sacral

"1. Journ. of Anat. and Physiol. vol. xvi. p. 106.

1. 'Challenger' Reports, pt. xlvii. p. 47."

index of 13 Australian males as 98.5; in the Negro it is 106, and Prof. Flower's measurements show that eight male Andamanese had a sacral index of 94. The Tasmanians in respect to their sacrum agree with the New Caledonians, and occupy a middle position between the Andamanese on the one hand and the Europeans on the other, and are not far removed from the Australians. From the measurements between the antero-superior iliac spines, the maximum crest width and the maximum length of the innominate bone, it will be seen that the pelvis in the Tasmanians and New Caledonians is as a whole smaller than in the European. The breadth-height and height-breadth index averages 124.9 and 80., according as we follow Topinard's or Verneau and Turner's method of estimating it. In this respect the proportions are very nearly the same in the European, New Caledonian and Tasmanian. The Brim measurements are perhaps those to which most interest attaches. The antero-posterior diameter of the brim is, according to my measurements, almost identical on the average in the European and Tasmanian males, but a notable difference occurs in the measurement of transverse breadth, the Tasmanian being considerably narrower than the European; consequently there is a considerable difference in the Brim-index of the two races, that of the former being 93.1, while in Europeans it is only 78.3. In seeking for the affinities of the Tasmanians in this respect, we find the Brim-index of the Australians is 98 according to

Turner, that of the Andamanese 98.8 by Flower. The Tasmanians therefore in this respect hold an intermediate position between the Europeans on the one hand and the Australians and Andamanese on the other, and agree very nearly with the New Caledonians, in whom the Brim-index is 94.6. This is unfortunately the only Melanesian group of which there are sufficient pelves to give anything like valuable data. The sub-pubic angle is more obtuse in the Europeans than in Tasmanians and New Caledonians, in whom it averages 61° and 60° respectively.

From the measurements of the Tasmanian pelves we conclude that in its essential form it occupies an intermediate position between the European pelvis on the one hand and the Australian and Andamanese (the latter being taken as a type of the Negrito race) on the other, and agrees very closely in all its important measurements with the New Caledonians."

Limb Bones. --The only Tasmanian limb bones I have been able to measure are those of the skeletons. It may be stated regarding them generally that they are well developed and as robust as those of Europeans. In this respect they differ very materially from the slender bones of the Australian natives. As an example of this I may say that I have confirmed Dr. Barnard Davis's observation that while the circumference of the most slender part in the centre of the shaft of the femur averages in the three Tasmanian skeletons 84 mm., in the Australian male it is only 75 mm., which is exactly what the minimum circumference of the female Tasmanians measures, while in two Australian females it averages 70 mm. The other bones show a similar proportion."

"The Scapula. --The form of the scapula in the Tasmanians differs most unexpectedly from that of the other black races, the average scapular index (which expresses the relation of the breadth of the bone to the length) and the infra-spinous index (which shows the relation between the breadth and infra-spinous portion of the bone) being much lower than in Europeans. The scapular index of the Tasmanian skeletons in the Royal College of Surgeons averages 60.3, and the infra-spinous index 81.4. In the skeleton in the Anthropological Institute these indices are still lower, reducing the average scapular index down to 59.0. In Europeans they average 65 and 89 respectively, in Australians 88.9 and 92.5, and in Andamanese 69.8 and 92.7. In the Apes these indices are considerably higher than in man, while in Bats, in which the scapula functions as a basis for the attachment of the muscles of flight, the indices are lower than in man. The peculiar character of the scapula in the Tasmanians then is its vertical shortness in proportion to its breadth."

The Clavicle. --The length of the clavicle in the three males averages 145 mm. , and in the female 130 mm. In two of the males the left clavicle is the longer, and in the female both are of equal length.

The Humerus. --The average length of the male humerus is 319 mm. , and of the female 174.5 mm. The right humerus is slightly longer than the left in all cases except the female, in which the left is 1 mm. longer than the right. There is no instance of an olecranon foramen being present in any humerus.

The Radius. --This bone averages in the three males 255 mm. , and in the female 214.5 mm. The left radius is on an average 2 mm. shorter than the right, in one instance the bones are equal, but in the female the right is 5 mm. shorter than the left. [211]

The Ulna. --The average length of the ulna in the males is 277 mm. , the right being the longer bone in two instances, and in the third the bones are of equal length.

The Hand. --Measured from the tip of the middle finger to the top of the os magnum measures in one male 171 mm. , and in the other 180 mm. ; in the female the bones are wanting to enable it to be measured.

The Femur. --The left femur is in each of the males the longer, its average length being 460.5 mm. , while the right is 457 mm. , the average of both femurs being 459 mm. In the female the right and left bones are equal, measuring 397 mm.

1: Roth--210-211

(No date) 1890

Tasmanians-2

116, 141

The Tibia. -- Unlike the femur the right tibia is in each case the longer, the average length of the right tibia being 387 mm. and 384 mm. of the left; thus the diminished length of the right femur is counterbalanced by the increased length of the right tibia and vice versa in the case of the left femur. The average length of the right and left tibiae is 386 mm. In the female the average length of the right and left tibiae is 314 mm., the right measuring 318 mm.

The Foot. -- The length of the male foot averages about 220 mm. "

"Proportions of the entire Extremities. --By adding the length of the humerus to that of the radius and the length of the femur to that of the tibia, we are able to compare the lengths of the limbs (less their terminal segments, the hand and foot) with the stature and with one another. We found that the average stature of the three male skeletons averaged 1627 mm. ; taking this as 100, we found that the length of the upper extremity (as represented by the added lengths of humerus and radius) is as 35.4 to 100, and that of the lower limb (as indicated by the lengths of the femur and tibia together) is 51.9; in the female these relations are 34.3 for the upper limb, and 50.0 for the lower. Topinard gives the relations in the New Caledonians of the upper and lower limbs to the stature as 35.5 and 51.7 respectively in the males, and as 34.6 and 52.6 in the females. In Europeans Topinard states the relations as 35.0 and 49.4 respectively in males, and as 34.1 and 49.5 respectively in females. From these results we see that while the upper extremity in the Tasmanians bears almost the same relations to the stature as it does in Europeans, the lower extremity is somewhat longer proportionately in the former than in the latter."

"The Intrinsic Proportions of the Limbs. --Relative to the average stature which is taken as 100, the proportions of the limb bones are as follows: in the males, the humerus 19.6, the radius 15.7, the femur 28.2, the tibia 23.7; and in the female the humerus 19.2, [212] the radius 15.0, the femur 27.9, the tibia 22.1. In 8 male New Caledonians the proportions are: humerus 20.2, radius 15.3, femur 27.9, tibia 23.8. In European males Topinard gives these relations as humerus 20.7, radius 14.3, femur 27.1, tibia 23.3; and in females, humerus 19.8, radius 14.3, femur 27.4, tibia 22.8. These results seem to show that, with the exception of the humerus, the limb bones are somewhat longer in proportion to the stature in the Tasmanians of both sexes than they are in Europeans. The very limited number of specimens from which the averages are derived in the case of the Tasmanians reduces considerably the value of these figures."

"Inter-membral Index. --The relation which the upper limb bears to the lower in the Tasmanians is as 68.0 to 100; in Europeans the relation is 69.3, in the Andamanese 68.3.

The Antibrachial Index. --The relation which the radius bears to the humerus, in the Tasmanians, is 79.9 in the males, and 78.1 in the females; while in Europeans it is 73 in males, and 72.4 in females; in the African Negro 79.0, and in the Negress 78.3; in Andamanese 81.7 and 80.6 in males and females respectively; in Australian males 76.6; in New Caledonian males 76, and in females 75.8. The forearm of the Tasmanian therefore agrees with the black races in being much longer in proportion to what it is in Europeans, and consequently more simian in character. It will be noticed that this index in the Tasmanians corresponds more closely with that of the Andamanese and Negros than the Australians and New Caledonians."

"The Tibio-femoral Index. --This shows the proportion which the distal segment of the lower limb bears to the proximal in the same way as the antibracheal index does those of the segments of the upper limb. It averages 84.1 in the male Tasmanians, and 79.1 in the female. In Europeans this index averages 81.1 in males and 80.8 in females; in New Caledonian males 83.1 and in females 82.3; in African Negro 82.9, in Negress 84.4, in Andamanese 84.4, in males and females respectively in Australians 84. In respect then of the tibio-femoral index, the Tasmanian, Andamanese, and Australian males are practically equal. The index being higher than in Europeans shows that the distal segment of the limb is longer than the proximal.

The Humero-femoral Index. --In the Tasmanian males it averages 69.5, and in the female 69.0; in Europeans 72.5 in males, in Andamanese males 70.3, and in females 69.2; in Australian males 71.4. The humerus of the Tasmanians therefore is relatively shorter in proportion to the length of the femur than in Europeans."

Tasmanians in Paris.

The Head as a Whole,		Males.	Females.
1	Vertical maximum projection	190.	171.
2	Diam. trans. max. or Bizygomatic	130.4	123.5
	Index of the 1st to the 2nd	145.7	137.6
Skull.			
Circumferen Antero- Posterior.	Cerebral part of frontal	116.6	110.5
	Parietal	126.5	121.
	Supra-occipital	57.	53.
	Sub-occipital	54.	51.
	Length of foram. mag.	34.	32.
	Basio-supra orbital radius	109.4	105.
	Total circumference	497.8	472.5
Transverse Circumference	Supra auriculo-bregmal curve	303.3	284.
	Circ. or diam. trans. supra-auric.	122.	120.5
	Total circumference	425.3	404.5
Horizontal Circumference	Anterior curve, pre-auricular	242.5	237.
	Posterior curve, post-auricular	281.1	262.
	Total	523.6	506.

1: Roth--214-215

(No date) 1890

Tasmanians-2

116, 141

	Males.	Females.
Antero-post. diam. max. ---	184.5	175.5
Diam. bi-parietal max. ---	142.8	131.5
I. Cephalic index, horizontal ---	77.4	74.9
Vertical diam. (basio-bregmal) ---	131.2	120.5
I. Index cephalic vertical ---	71.1	68.7
Diam. trans. frontal, min. {taken on the} ---	94.5	92.2
" " " sup. {crest.temp} ---	107.	106.
" " " maximum (proper) ---	111.2	107.
" " occip. (bi-asteric) ---	109.8	103.5
" antero post-iniac ---	180.3	174.
Approx. relation of the exter. volume ---	11035.	9670.
Capacity ---	1376.	1103.
Basilo-ophryal radius ---	109.4	105.
Basilo-mental ---	115.4	99.
Max. facial angle ---	69°	72°
Max. facial length from ophryon to chin ---	126.6	120.
Max. facial breadth, bizygomatic ---	130.4	123.5
I. Index of max. L. and B. ---	97.3	[215] 96.8

1: Roth--214-215

(No date) 1890

Tasmanians-3

116, 141

	Males.	Females.
Dist. of supr. orb. point to line of min. front. diam. ---	9.9	4.
" " " to root of nose ---	16.6	18.5
" " " to sup. alveolar point ---	80.3	80.
" " " to sub-nasal point ---	66.8	63.
Diam. trans. ext. bi-orbital median (bi-malar sup.) ---	107.3	103.
" bimalar (des pommettes) ---	110.8	98.
" " inferior ---	91.4	95.
Orbital height " ---	29.9	30.
" breadth ---	39.	37.
I. Orbital index ---	76.6	81.
Depth of orbits ---	56.	53.5
Overhang of sup. orb. border beyond infr. ---	5.	2.
Interorbital width ---	23.6	21.
Depth of nasal notch ---	7.	7.
Length of nasal bones (median) ---	14.6	13.5
Nasion to sub-nasal point ---	48.8	43.5
Nasal breadth ---	27.5	26.5
Minimum height of sup. maxillae ---	14.6	14.
Minimum sup. maxillary breadth ---	66.6	62.

1: Roth--214-215

(No date) 1890

Tasmanians-4

116, 141

	Males.	Females.
Length of palate vault ----	56.	52.
Height of symphyses of mandible ----	30.	25.
Height of posterior branch ---	54.	39.
Bigonial width ----	93.3	92.
Horiz. dist. from p. supra orb. to p. sub-nasal ----	10.4	7.
" " p. sub-nasal to p. alveol. sup. ----	4.2	5.
" " p. alv. sup. to incisor summit ----	5.	—
" " p. incis. summit to p. alv. infer. ----	1.5	—
" " p. alv. inf. to sub-mental p. ----	2.5	6.5
Prognathism alv. dent. sup. ----	9.2	—
" " inf. ----	4.	—
Angle, facial max. (Camper) ----	75°7	80°3
" " median ----	69°5	72°7
" " min. ----	63°7	—
Difference of max. and min. ----	12°	—

l: Roth--214-215

(No date) 1890

Tasmanians-5

116, 141

Different Measurements.		Males.	Females.
Horizontal axis of Broca	----	195.2	184
Height of occ. for. (ant. bord. above the axis)	----	10.8	8.
Breadth of occ. foramen	----	28.1	26.
Index of occ. for. L=100	----	85.5	81.2
Basilo-iniac radius	----	87.6	84
Basilo-lambdoidal radius	----	113.4	104
Basilo-nasial radius	----	96.6	103.
Basilo-subnasial radius	----	96.8	93.
Basilo-alveolar sup. radius	----	100.4	99.11